

IN THE CLAIMS:

1-16. (Cancelled)

17. (Currently Amended) A recording medium used ~~for storing data, the data~~
~~comprising a digital stream constituted by multiplexing~~ with a reproduction apparatus, the
5 reproduction apparatus including:

a video decoder operable to decode a video stream so as to obtain a moving
picture made of a plurality of pictures;

a graphics decoder operable to decode a first graphics data included in a graphics
stream so as to obtain a second graphics data which is to be combined with the moving picture,
10 and the graphics decoder including a graphics controller and an object buffer storing the second
graphics data;

a plane memory for rendering the second graphics data;

the recording medium comprising:

[[a]] the video stream;

15 and a the graphics stream[[,]] ; wherein:

the graphics stream includes one of more Display sets;

a leading Display set among the one or more Display Sets is of an Epoch Start
type;

the leading Display Set of the Epoch Start type includes the first graphics data and
20 window information indicating a size and position of a window, the window being a bounded
area for a display on a plane memory; and

when rendering a part of the second graphics data which is stored in the object buffer, the window information indicates the graphics controller to render the part of the second graphics data in the object buffer within the window on the plane memory while refraining from rendering the other part of the second graphics data in the object buffer outside of the window on the plane memory.

~~the video stream represents a moving picture made of a plurality of pictures,~~

~~the graphics stream includes a plurality of Display Sets each being a group of data that constitutes graphics for one screen,~~

~~a leading Display Set among the plurality of Display Sets is of an Epoch Start type,~~

~~the leading Display Set of the Epoch Start type includes graphics data and window information that specifies a window for rendering the graphics therein,~~

~~the graphics data represents graphics to be combined with the pictures,~~

~~the window information indicates a width, a height and a position of the window on a plane memory of a reproduction apparatus that combines graphics with the pictures, and~~

~~a Display Set following the leading Display Set is used for rendering graphics within the window.~~

18. (Currently Amended) A recording medium according to Claim 17, wherein:

~~[[the]] a width and [[the]] a height of the window are determined based on a ratio between a rate of an update of the window performed by the plurality of one or more Display Sets and a frame rate of the pictures.~~

19. (Currently Amended) A recording medium according to Claim 18, wherein:

the width and the height of the window are set so that a size of the window is $1/x$ of the plane memory corresponding to a size of each picture, where x is a real number indicating the ratio between the rate of the update of the window performed by the ~~plurality of~~ one or more

5 Display Sets and the frame rate of the pictures.

20. (Currently Amended) A recording medium according to Claim 17, wherein:

each Display Set includes control data stored in a packet, to which a decode time stamp and a presentation time stamp are attached[[,]] ;

10 the decode time stamp represents a start time on a reproduction time axis of corresponding Display Set[[,]] ; and

the presentation time stamp represents a end time on the reproduction time axis of the corresponding Display Set and an execution start time for displaying graphics based on the Display Set.

21. (Currently Amended) A recording medium according to Claim 20, wherein:

15 the graphics stream includes two or more Display Sets of the Epoch Start type[[,]]
; and

on the reproduction time axis, the window defined by the window information is active between the leading Display Set that is of the Epoch Start type and another Epoch Start type Display Set that is immediately after the leading Display Set.

22. (Currently Amended) A recording medium according to Claim 17, wherein:

if the Display Set following the leading Display Set of the Epoch Start type is a normal case Display Set, the Display set following the leading Display Set includes [[the]] control data, but does not include the graphics data and the window information[[,]] ; and

5 the control data included in the normal case Display Set instructs [[the]] a reproduction apparatus to render graphics within the window defined by the window information included in the Display Set of the Epoch Start type, using the graphics data included in the Display Set of the Epoch Start type.

23. (Currently Amended) A recording medium according to Claim 22, wherein:

10 ~~the reproduction apparatus includes an object buffer in addition to the plain memory,~~

~~the object buffer stores a graphics object obtained by decoding the graphics data included in the Display Set of the Epoch Start type, and~~

15 the control data included in the normal case Display Set includes crop information indicating a part of the graphics object stored in the object buffer ~~where~~ which is to be cut out and transferred to the ~~plain~~ plane memory.

24. (Currently Amended) A recording medium according to Claim 23, wherein:

20 the control data included in the normal case Display Set includes position information indicating a position within the window where the part cut out from the graphics is to be displayed[[,]] ; and

the part indicated by the crop information exists at the position indicated by the position information.

25. (Currently Amended) A reproduction apparatus ~~used for reproducing a digital stream constituted by multiplexing a video stream and a graphics stream, said reproduction apparatus~~ comprising:

5 a video decoder operable to decode the video stream so as to obtain a moving picture made of a plurality of pictures;

a graphics decoder operable to decode a first graphics data included in the graphics stream so as to obtain a second graphics data which is to be combined with the moving picture; [[and]]

10 a plane memory ~~used for combining graphics with the pictures, for rendering the second graphics data; wherein~~

the graphics decode includes a graphics controller and an object buffer storing the second graphics data;

the graphics stream includes ~~a plurality of one or more Display Sets; each being a group of data that constitutes graphics for one screen,~~

15 a leading Display Set among the ~~plurality of one or more~~ Display Sets is of an Epoch Start type,

the leading Display Set of the Epoch Start type includes the first graphics data and window information that specifies a window for rendering the graphics therein, indicating a size and position of a window, the window being a bounded area for a display on the plane memory;

20 and

when rendering a part of the second graphics data which is stored in the object buffer, the graphics controller is operable to use the window information in order to render the part of the second graphics data in the object buffer within the window on the plane memory

while refraining from rendering the other part of the second graphics data in the object buffer outside of the window on the plane memory.

~~the graphics data represents graphics to be combined with the pictures,
the window information indicates a width, a height and a position of the window
5 on a plane memory of a reproduction apparatus that combines graphics with the pictures, and
a Display Set following the leading Display Set is used for rendering graphics
within the window.~~

26. (Currently Amended) A reproduction apparatus according to Claim 25, wherein:
[[the]] a width and [[the]] a height of the window are determined based on a ratio
10 between a rate of an update of the window performed by the graphics decoder and a frame rate of
the pictures ~~determined by the video decoder.~~

27. (Currently Amended) A reproduction apparatus according to Claim 26, wherein:
the width and the height of the window are set so that a size of the window is $1/x$
of the plane memory corresponding to a size of each picture, where x is a real number indicating
15 the ratio between the rate of the update of the window and the frame rate of the pictures.

28. (Currently Amended) A reproduction apparatus according to Claim 25, wherein:
the graphics data included in the leading Display Set of the Epoch Start type is
compressed graphics[[,]] ; and
the graphics decoder includes:
20 a processor operable to decode the compressed graphics; and
a control unit operable to perform processing for clearing the window and
processing for writing graphics within the window.

29. (Currently Amended) A reproduction apparatus according to Claim 28, wherein:
each Display Set includes control data stored in a packet, to which a decode time
stamp and a presentation time stamp are attached[[,]] ;

the decode time stamp represents a start time on a reproduction time axis of
5 corresponding Display Set[[,]] ;

the presentation time stamp represents a end time on the reproduction time axis of
the corresponding Display Set and an execution start time for displaying graphics based on the
Display Set[[,]] ; and

the control unit starts the processing for clearing the window at the start time
10 represented by the decode time stamp, and finishes the processing for displaying graphics within
the window before the end time represented by the presentation time stamp.

30. (Currently Amended) A reproduction apparatus according to Claim 29, wherein:
the graphics stream includes two or more Display Sets of the Epoch Start type[[,]]
; and

15 the control unit activates the window defined by the window information
between, on the reproduction time axis, the leading Display Set that is of the Epoch Start type
and another Epoch Start type Display Set that is immediately after the leading Display Set.

31. (Currently Amended) A reproduction apparatus according to Claim 28, wherein:
~~the reproduction apparatus includes an object buffer in addition to the plain~~
20 ~~memory,~~

the object buffer stores a graphics object obtained by decoding the graphics data
included in the Display Set of the Epoch Start type[[,]] ; and

if the Display Set following the leading Display Set of the Epoch Start type is a normal case Display Set, the Display set following the leading Display Set includes [[the]] control data, but does not include the graphics data and the window information[[,]] ; and

the control unit included in the graphics decoder reads the graphics object from
5 the object buffer, and using the read graphics object and based on the control data included in the normal case Display Set, performs the processing for writing graphics within the window defined by the window information included in the Display Set of the Epoch Start type.

32. (Currently Amended) A reproduction apparatus according to Claim 31, wherein:
the control data included in the normal case Display Set includes crop
10 information[[,]] ; and

the control unit cuts out a part of the graphics object stored in the object buffer as indicated by the crop information.

33. (Currently Amended) A recording method for a recording medium, ~~comprising~~
used with a reproduction apparatus, the reproduction apparatus including:

15 a video decoder operable to decode a video stream so as to obtain a moving picture made of a plurality of pictures;

a graphics decoder operable to decode a first graphics data included in a graphics stream so as to obtain a second graphics data which is to be combined with the moving picture, and the graphics decoder including a graphics controller and an object buffer storing the second
20 graphics data;

a plane memory for rendering the second graphics data;

the recording method comprising:

~~a step of generating application data; and~~
~~a step of recording the generated data on the recording medium, wherein~~
the application data includes ~~[[a]]~~ the digital stream constituted by multiplexing a
video stream and a graphics stream,

5 ~~the video stream represents a moving picture made of a plurality of pictures;~~
the graphics stream includes a plurality of one or more Display Sets; ~~each being a~~
~~group of data that constitutes graphics for one screen;~~

a leading Display Set among the plurality of one or more Display Sets is of an
Epoch Start type~~[[,]]~~ ;

10 the leading Display Set of the Epoch Start type includes the first graphics data and
window information ~~that specifies a window for rendering the graphics therein;~~ indicating a size
and position of a window, the window being a bounded area for a display on a plane memory;
and

when rendering a part of the second graphics data which is stored in the object
15 buffer, the window information indicates the graphics controller to render the part of the second
graphics data in the object buffer within the window on the plane memory while refraining from
rendering the other part of the second graphics data in the object buffer outside of the window on
the plane memory.

~~the graphics data represents graphics to be combined with the pictures;~~

20 ~~the window information indicates a width, a height and a position of the window~~
~~on a plane, the plane being a plane memory of a reproduction apparatus that combines graphics~~
~~with the pictures, and~~

~~a Display Set following the leading Display Set is used for rendering graphics within the window.~~

34. (Currently Amended) A computer program stored on a computer readable medium used with a reproduction apparatus, the reproduction apparatus including:

5 a video decoder operable to decode a video stream so as to obtain a moving picture made of a plurality of pictures;

a graphics decoder operable to decode a first graphics data included in a graphics stream so as to obtain a second graphics data which is to be combined with the moving picture, and the graphics decoder including a graphics controller and an object buffer storing the second
10 graphics data;

a plane memory for rendering the second graphics data;

the computer readable medium comprising:

the video stream;

the graphics stream;

15 wherein:

~~for reproducing a digital stream constituted by multiplexing a video stream and a graphics stream by having a computer perform video decoding of the video stream to obtain a moving picture made of a plurality of pictures and graphics decoding, wherein~~

 the graphics stream includes a plurality of one or more Display Sets;

20 ~~each being a group of data that constitutes graphics for one screen;~~

 [[a]] the leading Display Set among the plurality of one or more Display Sets is of an Epoch Start type[[,]] :

the leading Display Set of the Epoch Start type includes the first graphics data and window information indicating a size and position of a window, the window being a bounded area for a display on a plane memory; and

when rendering a part of the second graphics data which is stored in the object
5 buffer, the window information indicates the graphics controller to render the part of the second
graphics data in the object buffer within the window on the plane memory while refraining from
rendering the other part of the second graphics data in the object buffer outside of the window on
the plane memory.

~~that specifies a window for rendering the graphics therein,~~
10 ~~the graphics data represents graphics to be combined with the pictures,~~
~~the window information indicates a width, a height and a position of the window~~
~~on a plane, the plane being a plane memory of a reproduction apparatus that combines graphics~~
~~with the pictures, and~~

~~the computer program instructs the computer to render, within the window~~
15 ~~defined by the window information, graphics of the leading Display Set and a Display Set~~
~~following the leading Display.~~

35. (Currently Amended) A reproduction method ~~for reproducing a digital stream~~
~~constituted by multiplexing a video stream and a graphics stream, the reproduction method~~
~~comprising:~~

20 decoding a video stream so as to obtain a moving picture made of a plurality of
pictures;

decoding a first graphics data included in a graphics stream so as to obtain a second graphics data which is to be combined with the moving picture, using a graphics decoder;

storing the second graphics data using an object buffer;

rendering the second graphics data using a plane memory;

5 wherein;

the graphics decoder includes a graphics controller and the object buffer;

~~video decoding of the video stream to obtain a moving picture made of a plurality of pictures; and~~

~~graphics decoding, wherein~~

10 the graphics stream includes ~~a plurality of~~ one or more Display Sets each being a group of data that constitutes graphics for one screen,

a leading Display Set among the ~~plurality of~~ one or more Display Sets is of an Epoch Start type[[,]] ;

15 the leading Display Set of the Epoch Start type includes the first graphics data and window information indicating a size and position of a window, the window being a bounded area for a display on a plane memory; and

20 when rendering a part of the second graphics data which is stored in the object buffer, the window information indicates the graphics controller to render the part of the second graphics data in the object buffer within the window on the plane memory while refraining from rendering the other part of the second graphics data in the object buffer outside of the window on the plane memory.

~~that specifies a window for rendering the graphics therein;~~

~~the graphics data represents graphics to be combined with the pictures;~~

~~the window information indicates a width, a height and a position of the window on a plane, the plane being a plane memory of a reproduction apparatus that combines graphics with the pictures, and~~

~~the reproduction method renders, within the window defined by the window information, graphics of the leading Display Set and a Display Set following the leading Display.~~

36. (Currently Amended) ~~An integrated circuit for processing a digital stream constituted by multiplexing a video stream and a graphics stream, the integrated circuit comprising:~~

~~a video decoder operable to decode the video stream so as to obtain a moving picture made of a plurality of pictures;~~

~~a graphics decoder[; and]] operable to decode a first graphics data included in the graphics stream so as to obtain a second graphics data which is to be combined with the moving pictures;~~

~~a plane memory used for combining graphics with the pictures, wherein for rendering the second graphics data;~~

~~wherein;~~

~~the graphics decoder includes a graphics controller and an object buffer storing the second graphics data;~~

~~the graphics stream includes a plurality of one or more Display Sets; ~~each being a group of data that constitutes graphics for one screen;~~~~

~~a leading Display Set among the plurality of one or more Display Sets is of an Epoch Start type[[,]] ;~~

the leading Display Set of the Epoch Start type includes the first graphics data and window information indicating a size and position of a window, the window being a bounded area for a display on the plane memory; and

5 when rendering a part of the second graphics data which is stored in the object buffer, the graphics controller is operable to use the window information in order to render the part of the second graphics data in the object buffer within the window on the plane memory while refraining from rendering the other part of the second graphics data in the object buffer outside of the window on the plane memory.

10 ~~that specifies a window for rendering the graphics therein,~~
~~the graphics data represents graphics to be combined with the pictures,~~
~~the window information indicates a width, a height and a position of the window on a plane, the plane being a plane memory of a reproduction apparatus that combines graphics with the pictures, and~~

15 ~~a Display Set following the leading Display Set is used for rendering graphics within the window.~~